Figure 9. Seasonal forested wetland.

Figure 10. Forest depression pond.

Figure 11. Drainage ditch.

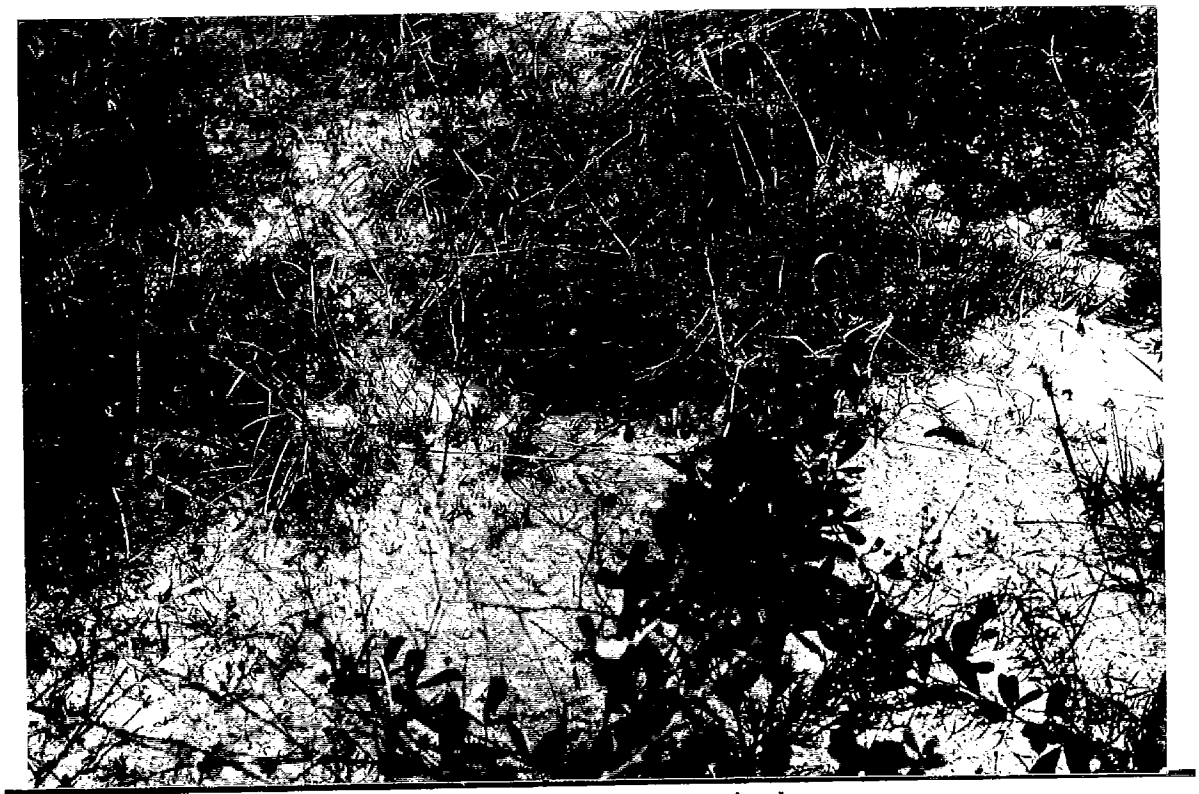

Figure 12. Active gopher tortoise burrow.

Site 13C. Imeson International Industrial Park, Inc./Barnett Banks Trust Co. Parcel

This parcel is an approximately 147-acre tract located less than a quarter mile northeast of site 13A within the Broward and Trout River peninsula (Figure13). The site lies roughly north and west of Hecksher Drive and south and west of a Jacksonville sewage treatment plant. Its boundary is broadly identified as the limits of active and inactive sand mining and concrete reclamation from an inactive Imeson Airport runway along the parcel's western edge. A ground survey was conducted on August 15, 1996.

The original soil associated with Site 13C was Kershaw-Ortega. Sand mining has destroyed all but about 5% of the native sandhill community associated with this excessively drained soil. The southern third of the parcel, which is no longer actively mined, is saucer shaped with gently to moderately sloped ridges and isolated knolls interspersed with dry depressions (Figure 14). This area is primarily vegetated with ground cover consisting of pioneer grasses (*Andropogon* sp.) and early successional herbaceous plants, including partridge pea (*Cassia chamaecrista*), sandspur (*Cenchrus* sp.), and ragweed (*Ambrosia* sp.). Approximately two dozen mostly large and active gopher tortoise burrows were observed in this area (Figure 15). An Eastern diamondback rattlesnake (*Crotalus adamanteus*) was observed at the entrance of one of the active burrows. The lack of smaller diameter tortoise burrows suggests that the population lacks reproductive viability and may be a remnant of a larger, self-sustaining population that was likely associated with the original sandhill habitat. As a state species of special concern, any impacts to the gopher tortoise would first have to be coordinated with the Florida Game and Fresh Water Fish Commission.

No wetlands were observed on the parcel. The Service does not object to the proposed use of this site for spoil disposal. Appropriate mitigation would be required, however, if pipeline conveyance of dredged material and drainage water into and out of this site results in off-site impacts to intertidal wetlands within the Drummond Creek drainage.

With respect to federally protected species, the Service believes the Eastern indigo snake may occur at this site in association with the gopher tortoise burrows.

Site 13D. Barnett Bank Trust Co. (Bostwick Trust) Parcel

This parcel is an approximately 111-acre tract located adjacent to and west of the Broward River and north of the Atlantic Coast Line railroad tracks (Figure 16). Its eastern and southern boundaries are defined by the river and railroad tracks, respectively; its northern boundary is the Cedar Bay Road sewage treatment plant and access road, while its western limits abut the mining operations within site 13C. A ground survey was conducted on August 15, 1996.

Site 13D is underlain by two major soils, Kershaw-Ortega and Ortega fine sand, having water drainage characteristics ranging from excessive to moderate. The later soil predominates along the parcel's eastern boundary. Each soil supports a different vegetative community.

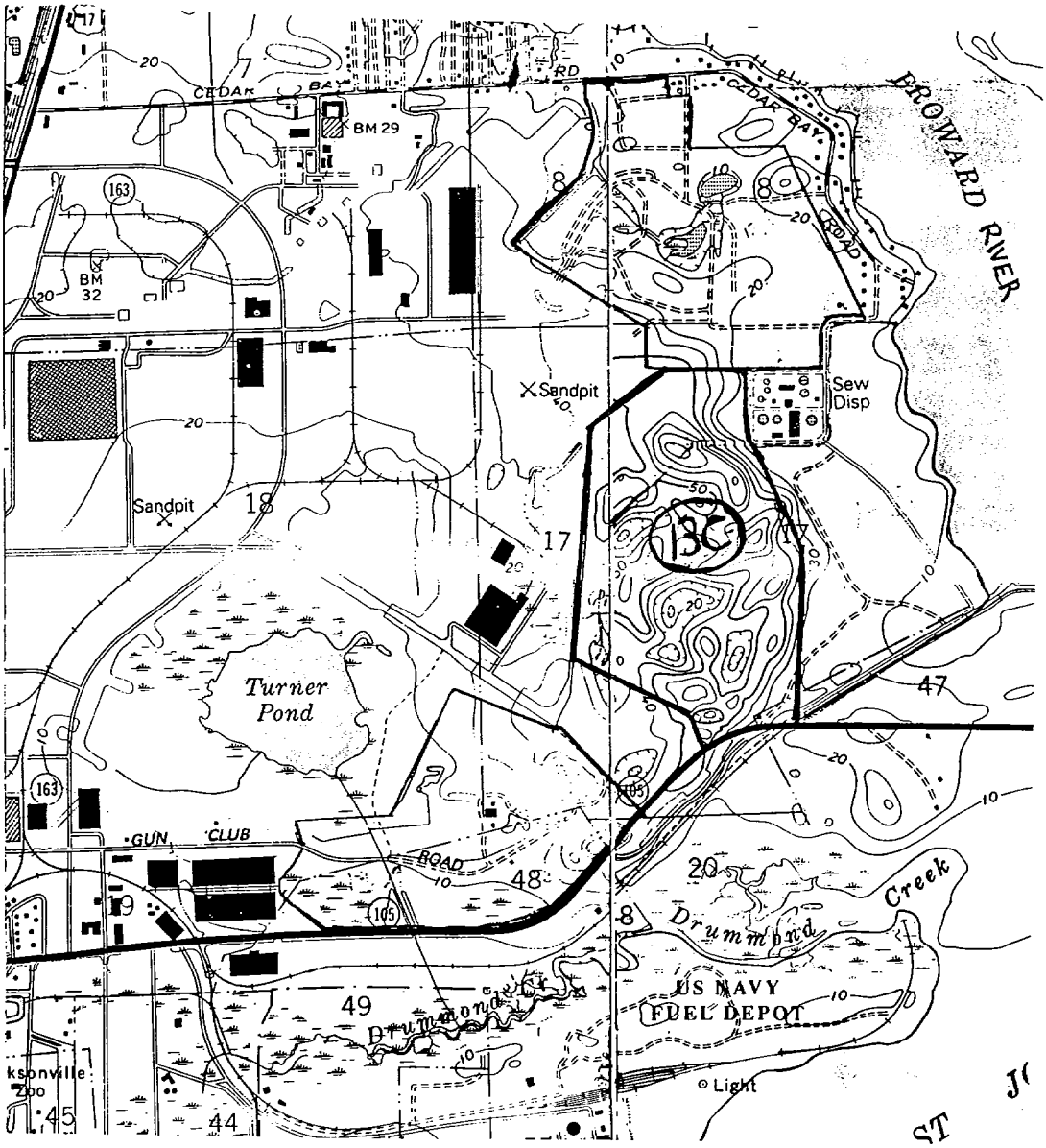

Figure 13. Site 13C

Figure 14. Inactive sand mine area.

Figure 15. Active gopher tortoise burrow.

A mesic hardwood hammock occurs along the border of the river at the lowest elevations. Hammock width ranges from about 150 to 800 feet, with the older growth closest to the river. The canopy consists of live oak, laurel oak, southern magnolia (*Magnolia grandifolia*), and pignut hickory (*Carya glabra*); the understory includes black cherry (*Prunus serotina*), dogwood (*Cornus florida*), redbud (*Cercis canadensis*), witchhazel (*Hamamelis virginiana*), and persimmon (*Diospyros virginia*). The shrub layer includes wax myrtle (*Myrica cerifera*), beauty berry (*Callicarpa americana*) and blueberries (*Vaccinium* spp.) (Figure 17). Some small, narrow patches of fringing salt marsh occur along the hammock's border with the Broward River.

The western half of the site consists of an unbalanced longleaf pine-turkey oak forest. The canopy contains scattered mature longleaf pine and many relatively young turkey oak as well as other hardwoods such as post oak (*Quercus stellata*), bluejack oak (*Quercus incana*), sassafras (*Sassafras albidum*), and persimmon. The structure and age of these trees indicate that the area had been logged in the past, but not burned (Figure 18). Some regeneration of longleaf pine is occurring along roadsides (Figure 19). The shrub and ground cover layers include blueberry (*Vaccinium* spp.), saw palmetto, chinquapin (*Castanea* sp.), wiregrass (*Aristida stricta*), and gopher apple (*Licania michauxii*).

With the exception of previous timber cutting, some logging roads, and a power line right-of-way, the site survey did not reveal any other significant human impacts. Active gopher tortoise burrows of different sizes, suggesting one or more reproducing populations, were observed along the roads and other places where small openings occurred within the sandhill's predominant oak canopy (Figure 20). The future of these apparently self-sustaining populations is in jeopardy, however, unless shading effects from unnatural hardwood densities are reduced and the typically open longleaf pine-turkey oak community is restored through habitat management.

Since this site lacks freshwater wetlands, total species diversity is probably less than what would be expected at site 13A. Past and present human disturbance at site 13D is much less, however, than at 13A and its extensive forested border with the Broward River provides an edge supplying roosts for bald eagles (*Haliaeetus leucocephalus*) and wading birds, as well foraging and nesting habitat for other resident and migratory birds. The existing, generally intact longleaf pine-turkey oak community is relatively unique within the lower Broward River drainage and provides food and shelter for a variety of vertebrate and invertebrate species. Use of the tract for spoil disposal or other future development would have a significant impact on the wildlife in the area and might require some form of upland mitigation based on State of Florida policies. Project impacts to the gopher tortoise would first have to be coordinated with the Florida Game and Fresh Water Fish Commission.

Based on its ecological attributes, the Service objects to the use of this parcel for spoil disposal and believes that other potential project impacts to this site should be kept to a minimum. We therefore recommend that the Corps consider using this site only for a potential pipeline and

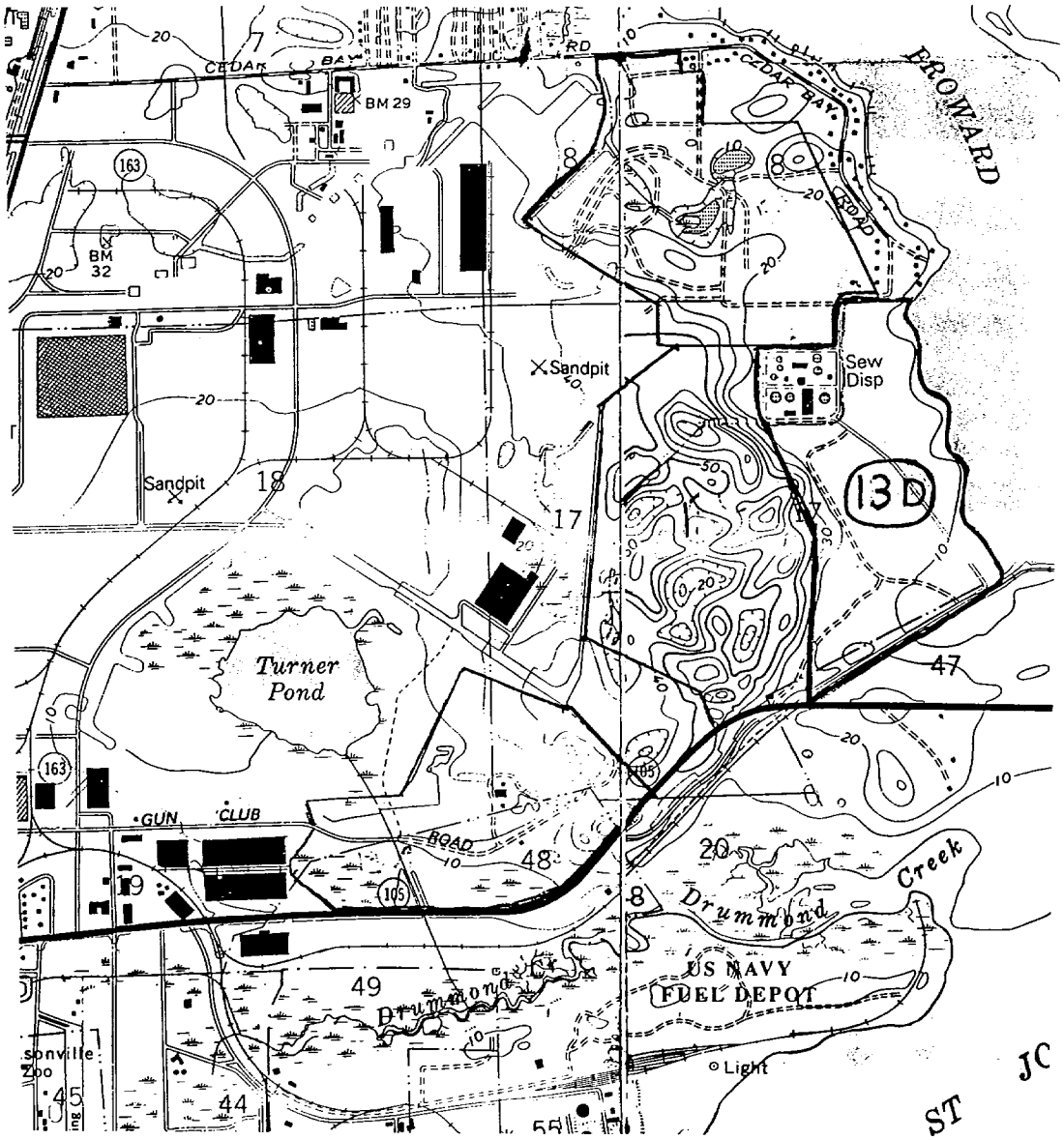

Figure 16. Site 13D

Figure 17. Mesic hardwood hammock community.

Figure 18. Turkey oak dominated sandhill community.

drainage right-of-way to transport spoil and discharge water between the Broward River and the more disposal-appropriate site 13C. The Service further recommends that this right-of-way be located along the southern border of the property adjacent to the railroad right-of-way. This sighting would minimize further fragmentation of habitats within this site. Should any pipeline right-of-way impact intertidal wetlands along the Broward River, the Corps would be required to mitigate for the expected impacts.

The site may support the federally protected Eastern indigo snake and bald eagle.

Site 13E. Imeson/Carlos Cedar Bay Road Parcel

This parcel is an approximately 153-acre tract located south and west of Cedar Bay Road near the Broward River and at the northeast corner of the Broward and Trout River peninsula (Figure a). Its western border extends from north Cedar Bay Road south to site 13C and abuts development within the Imeson Industrial Park. The city sewage treatment plant defines a portion of the parcel's southern boundary, while its eastern boundary roughly parallels Cedar Bay Road and lies west of private residences. A ground survey was conducted on July 10, 1996.

Site 13E is underlain by two soils, Kershaw Ortega and Pottsburg fine sand. The former soil predominates and supports the typical sandhill ridge community observed at other excessively drained sites throughout the peninsula. The somewhat poorly drained Pottsburg fine sand forms an elbow through the central and northwestern portions of the site and is associated with the sites' open water and wetland habitats.

The northwestern, northeastern, and southwestern portions of this site are disturbed uplands with two large fields and a number of smaller open areas, usually associated with the intersections of old logging roads. The large field in the northeastern corner is an unvegetated former sand mining pit, while the other field exhibits early vegetative succession and is dominated by grasses and herbaceous forbs (Figures 22 and 23). The smaller openings exhibit advanced plant succession and include numerous grape vines (*Vitus rotundifolia*) and various woody shrubs such as wax myrtle, shiny sumac (*Rhus copallina*) and yaupon (*Ilex vomitoria*) (Figure 24). The remainder of the vegetative community within these portions consists of a mixture of longleaf and slash pine and mixed oak associations similar to the disturbed sandhill community within site 13A. Significant longleaf pine regeneration was evident in the smaller open areas and along some sections of roadside. Active gopher tortoise burrows were observed in similar areas as well as within the large successional field. The range of burrow sizes suggests that these sections support one or more self-sustaining populations (Figures 25 and 26).

The remainder of uplands at this site consist of an unbalanced sandhill community dominated by turkey oak with a few scattered mature longleaf pine. Longleaf pine regeneration was minimal and appeared restricted to the occasional opening within the oak dominated canopy. Wiregrass and the few active gopher tortoise burrows seen also were restricted to these areas as well as scattered along some roadsides (Figure 27).

The on-site wetlands consist of two shallow, connected ponds and two narrow, mixed forested drainages totaling between 10 and 15 acres. Floating and emergent aquatic vegetation associated with the ponds included water shield (*Brasenia schreberi*), white water lily (*Nymphaea odorata*), spatterdock (*Nuphar luteum*), cattail, and spikerush (*Eleocharis* sp.). The drainages contained red maple, slash pine, gallberry (*Ilex glabra*), elderberry (*Sambucus canadensis*) and chain fern (*Woodwardia* sp.). Wood ducks (*Aix sponsa*) were observed at one of the ponds (Figures 28 and 29).

The past and current impacts at this site resemble those at site 13A though on a lesser scale. Its ecological attributes resemble those at both sites 13A and 13D, though again to a lesser degree. The Service would not object to some use of this property for the proposed project and provides the following recommendations. Since site 13E is contiguous with 13C, we recommend combining the parcel's northeastern portion and western half with site 13C to form one large potential spoil disposal area. The Corps would then have to provide comparable mitigation for the expected loss of the mixed forested and shallow water wetlands within those sections. Due to the special wildlife values associated with sandhill habitat, and its continuity with site 13D, the Service objects the use of the east central and southeastern sections of site 13E as locations for potential spoil disposal.

Mitigation for upland loss may be required pursuant to State of Florida guidelines. Any State compensation, however, would probably be based on the presence of and impacts to gopher tortoises and would have to be coordinated with the Florida Game and Fresh Water Fish Commission.

Federally protected species which may occur at this site include the wood stork and Eastern indigo snake.

Site 16. Polly Town

This parcel is an approximately 142-acre tract located in the north central portion of the Broward River/Dunn Creek peninsula (Figure 30). The northern boundary is bordered by the Seaboard Coast Line railroad track, the southern boundary by an old logging road adjacent to uplands and a major freshwater wetland system, the western boundary by Eastport Road, and the eastern boundary by the community of Polly Town. A ground survey was conducted on August 13, 1996.

Figure 19. Longleaf pine regeneration.

Figure 20. Young gopher tortoise burrow.

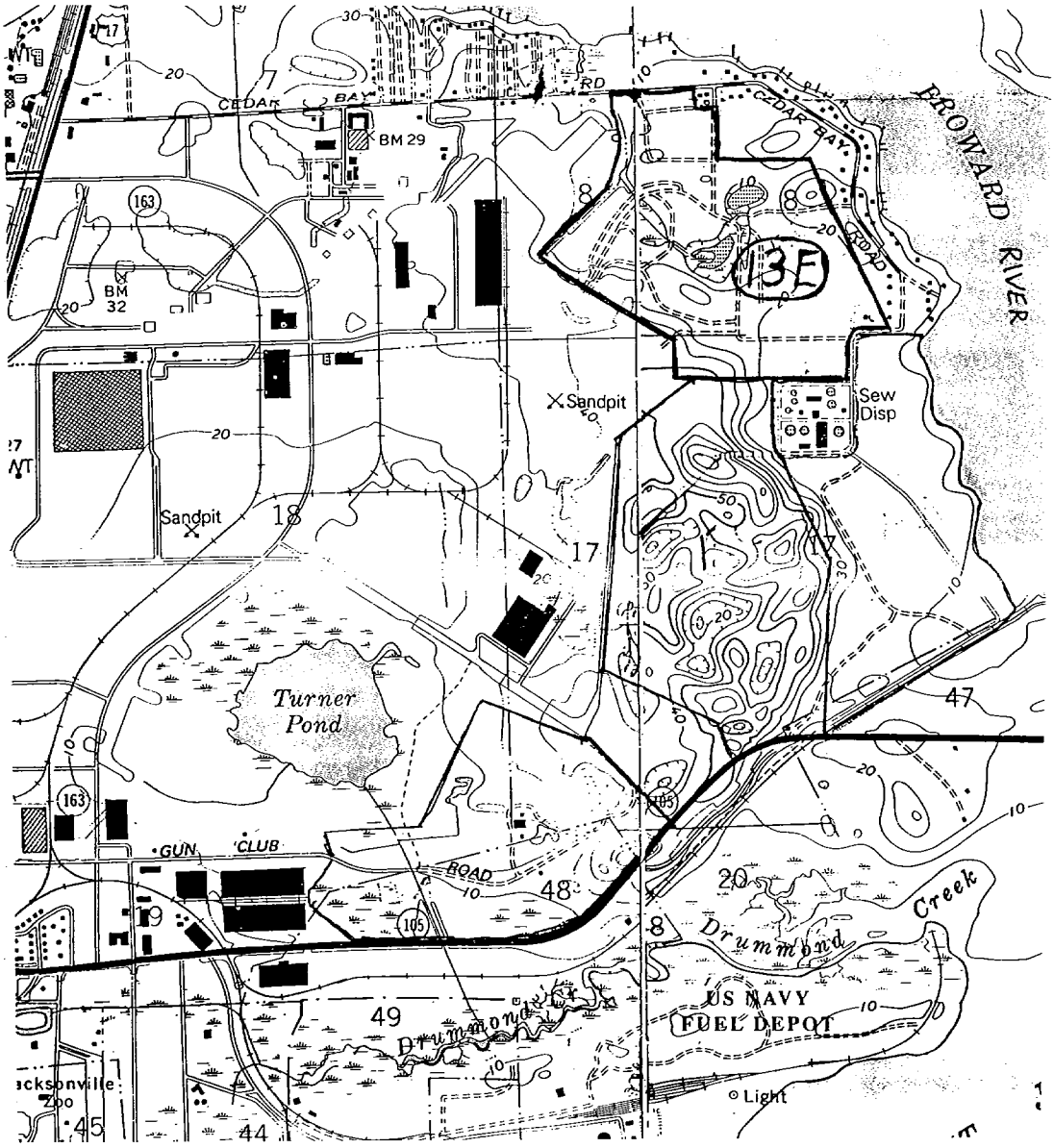

Figure 21. Site 13E

Figure 22. Abandoned sand mine.

Figure 23. Successional field.

Figure 24. Logging road opening.

Figure 25. Longleaf pine regeneration along roadside.

Figure 26. Active gopher tortoise burrow.

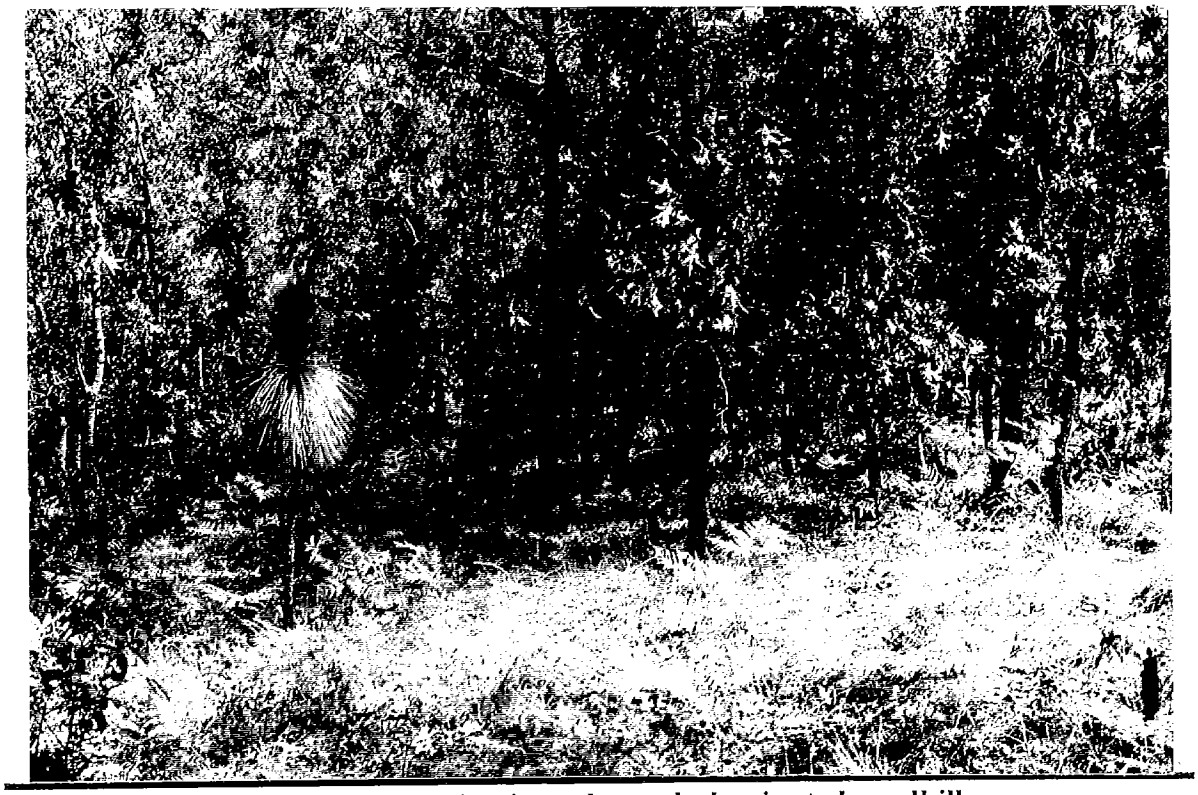

Figure 27. Opening in turkey oak-dominated sandhill.

Figure 28. Sandhill pond.

Figure 29. Sandhill pond.

Site 16 is underlain by three soils: Kershaw-Ortega, Ortega fine sand, and Pottsburg fine sand. Previous surveys of site 16 in 1988 and 1993 indicated that the property had been managed for timber and supported different-aged stands of slash pine. Approximately one-half of the property, primarily the west central, south central, and southwestern portions, appears to still be under active timber management (Figure 31). The eastern section, closest to Polly Town, consists of a mixed pine/hardwood community in various stages of succession. The north central and northwestern sections are previous cutovers exhibiting advanced succession and dominated by turkey oak, scattered mature and reproducing longleaf pine, gallberry, pawpaw (*Asimina* sp.), wiregrass, and St. Johns-wort (*Hypericum* sp.) (Figure 32). The east central portion contains a more recent cutover with a very sparse canopy consisting of a few longleaf pine, a low shrub understory comprised of scattered turkey oak, wax myrtle and dense clumps of saw palmetto, and a ground layer with light to moderate vegetative cover and having wiregrass and various herbs as the major components. Active gopher tortoise burrows were most abundant in the cutover areas. A few active burrows were observed along the transition area of the mixed hardwood/pine community, as well as adjacent to logging roads and the rare open areas within the active slash pine plantation (Figure 33). The different burrow sizes encountered suggest the existence of a small, self-sustaining population. This population likely represents the remnant of a much larger population which inhabited the historic sand ridges characteristic of nearly two-thirds of the property.

Three isolated freshwater wetlands occur within site 16. Two of the sites are designated as POWH on the National Wetlands Inventory Map, (Eastport Quadrangle), which indicates permanently flooded ponds. These depressional wetlands held no water at the time of the site visit. The presence of wetland vegetation such as soft rush and sedges suggest that these wet areas are now intermittently flooded, probably from seasonal rains. The total size of both wetlands is approximately 2.5 acres (Figures 34 and 35). The third wetland is a remnant of a combination emergent and scrub-shrub wetland that was once part of the larger system that had been ditched, drained, and planted in slash pine. The remnant wetland, connected by a road culvert to other off-site wetlands, is dominated by willow, wax myrtle, and red cedar, and is less than one acre in size.

The diversity and abundance of wildlife associated with this parcel has likely been historically reduced as a result of man's impacts such as silviculture, poaching, and dumping. However, due to the presence of permanent and ephemeral wetlands and mosaic of habitats at different stages of successional growth, site 16's wildlife value is probably greater than previously was assessed. The Service believes this value is most significant to plants, resident and migratory birds, reptiles, amphibians, and various invertebrates. The value likely is highest within and around the wetlands and the cutover areas, intermediate in the mixed pine/hardwood community, and lowest within the standing timber plantation. Project use of this parcel would result in the complete and unavoidable loss of its freshwater wetlands. Without the project, these values will diminish if silvicultural practices are reinitiated in the untimbered areas, if the area is developed, or if the cycle of plant succession within the natural sand ridge is not managed through prescribed burning or similar habitat management practices. The Corps

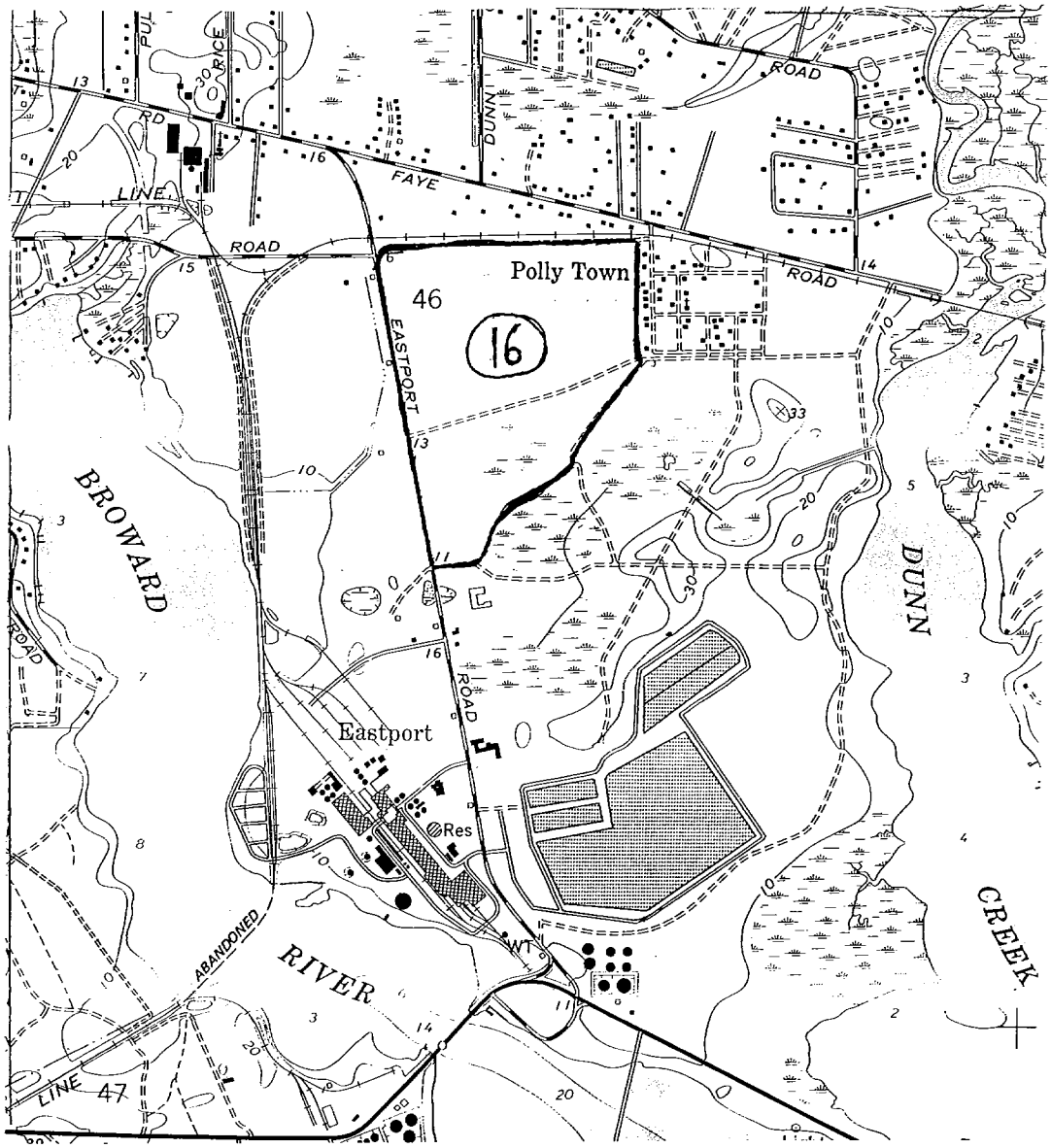

Figure 30. Site 16